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RELATIONSHIP BETWEEN AD ELEMENTS, RECALL AND LIKEABILITY IN SHORT YOUTUBE ADS

Master`s Thesis

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Abstract

In this study, the relationship between ad elements, ad recall and likeability was investigated. Six short video advertisements were shown to 35 participants and their eye-movement and emotional reaction to the ads were measured. Ad recall and likeability were assessed with a questionnaire. Ad elements (brand, product, endorsers) were marked as dynamic AOIs. The results showed that using a brand, product or endorser element in short ads does not significantly result in higher recall or likeability. The only significantly important result related to prior exposure to ads is that when ads were new to participants, brand and product elements were looked more often and for longer.

Keywords: Short video advertising, ad elements, eye-tracking, ad recall, ad likeability, emotions

Introduction

The effectiveness of TV commercials still exists (increasing sales mainly through generating brand awareness) (Rubinson, 2009), but other video advertising platforms are being utilized more. The reason for this is that consumers are increasingly using video watching platforms and companies can more efficiently pursue specific target groups.

According to different studies and statistical pages (Hills, 2018; Statista, 2018), Youtube is the most popular social media platform in the US and the second most popular website in the world ("The top 500 sites on the web," 2019). In Estonia, it is also the second most visited website (Mesipuu, 2018; *Wave 8: The Language of Content*, 2014). When asked about previous day's activities, 67% of the respondents in Estonia answered watching TV for at least 5 minutes and 40% answered watching Youtube content. Watching Youtube for at least 5 minutes on the previous day was highest among aged 16-24 years at 75 percent. (*YouTube profiling study*, 2018) Although TV is still the main medium for watching video content, Youtube is growing fast especially among younger people.

For companies an important question arises: are the viewing habits for television and video sites the same or different? Should the ads be the same and can they capture viewers' attention? Google and Ipsos eye-tracking study revealed that 18-49-year olds pay more (84% higher attention rate) attention to Youtube ads than to TV ads. At the same time, however 59% of millennials skip Youtube ads (Gallagher, 2017). According to another study (Elkin, 2016) the number could be as high as 90%. On the other hand, research on attitudes towards online advertising has shown that a positive advertising response is related to online advertising effectiveness (Ha, 2008).

It can be presumed that since younger generation watches more video content from online video platforms and attention to these ads might be higher, more and more companies begin to use these platforms for advertising and start competing for viewers' attention as this generation gets older. The ads also need to generate positive response in order not to lose viewers' attention.

Online video platforms (like Youtube) have previously been researched from the user-generated point of view (for example Smith, Fischer, & Yongjian, 2012). In recent years, there has also been some research on Youtube as an advertising channel (for example Guixeres et al., 2017; H. Li & Lo, 2015; Pashkevich, Dorai-Raj, Kellar, & Dan, 2012; Verhellen, Dens, & Pelsmacker, 2013; Voorveld et al., 2018; Zhang & Yuan, 2018). Though YouTube was initially seen more as a platform for user-generated videos, it has now become recognised as a marketing channel.

As an advertising channel, Youtube needs to be efficient for people who use it to promote their products and brands. Advertisers can assess the quality of their ad by analyzing views and clicks, but ads also need to promote the brand and make the product desirable in order to generate real sales. Video advertising effectiveness (ad recall, likeability, consideration, purchase intent) in general and its elements have not been researched in a great extent to date. When choosing Youtube as an advertising platform, viewers' attention usually needs to be captured in the first 5 seconds of the ad. To the authors knowledge the relationship between ad elements, recall and likeability in a short video format (3-8 seconds) has never been studied before.

The purpose of this study is to find out how ad elements in short Youtube ads are related to recall and likeability of these ads. Research questions helping to fulfill the study's purpose are:

- Which video ad elements capture attention?
- Which video ad elements hold attention?
- Which ads generate positive feelings?
- How well are the ads memorized?
- How are the ads liked?

This study gathers theoretical knowledge about previous findings regarding ad elements, visual attention to these elements, emotions caused by ads and the relationship between recall and likeability. The results contribute to overall ad effectiveness research field with findings concerning short videos and how prior exposure affects eye-movements to ad elements. The results also help advertisers create shorts ads that capture attention, are memorable and likeable.

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Theoretical background

Global ad expenditure is increasing yearly and digital advertising category is growing the fastest. McKinsey (2016) predicted that in year 2017 the digital advertising share (39%) globally will be the largest and exceeds advertising expenditures made on TV advertising (35,5%). Others have said (Eeden & Chow, 2018) that the percentage of global digital revenue in year 2017 might be as high as 48% and will increase over 50% in the year 2018.

All these investments are made in order to gain something in return – advertisers need to constantly remind customers about the brands and products in order to drive sale numbers. Therefore, the ads need to be effective. Ad effectiveness has been usually researched by two main approaches: diagnostic marketing metrics (for example awareness, preference, loyalty) and evaluate marketing metrics (for example sales, market share, profits) (McAlister, Srinivasan, Jindal, & Cannella, 2016). These two approaches are closely connected and effectiveness in one might predict good results in the other. Evaluate marketing metrics can be assessed when they are accessible, for instance they can be evaluated by people working for the company. Since this kind of data is usually not available to the public, researchers must use diagnostic marketing metrics to evaluate effectiveness of the ads. Evaluate marketing metrics are also used in this study in order to assess ad effectiveness.

Digital advertising includes many types and formats of advertising, but they can be divided by information type: text-based, text–picture mixed, picture-based and video-based information. A study showed that among these formats video-based advertising has the strongest effect on drawing users attention. (Hsieh & Chen, 2011) Video advertising and attention have been the subject of some studies made in recent years (for example (H. Li & Lo, 2015; Simmonds, Bellman, Kennedy, Nenycz-Thiel, & Bogomolova, 2019; Zhang & Yuan, 2018)

In addition, Youtube has analyzed it's TrueView in-stream advertising format, which means that longer than 5 second ads can be skipped after the first 5 seconds. Survey (Pashkevich et al., 2012) results showed that this advertising format is effective because

viewers can assess the ads and decide if they want to watch them until the end or skip them if they are not interested in the content. This means that advertisers are advised to produce advertising that is very capturing in the first 5 seconds. Some advertisers have gone a step further and have made only 5 second ads or short ads.

Video advertising is a combination of visual elements. These elements compete with each other to gain the viewers' attention. Ad producers might not consciously know what elements gain more attention than others, but there are some studies, that have researched this aspect. For example Wooley (2015) analyzed the eye-tracking data of 49 participants who were shown 35 TV-ads. In those ads 2695 areas of interest (visual elements) were coded and separated into groups (for example logo, branding, product, face, body part, animal, animation, text etc.). These areas were also coded according to their features (location on screen, size of the element, background type, movements, color and action). The results showed that highly relevant visual elements (such as faces, products and branding elements) and highly salient features (large sizes, center position and texts) are more likely to capture visual attention compared to other elements used in video advertising. (*ibid.*)

Zhang & Yuan (2018) took the video advertising elements research even further and looked for relationships between elements from the videos (for example product, brand and endorser), eye-movement metrics and effectiveness (ad recall, attitude towards ads and purchase intent). The used method was eye-tracking and six 30 second ads were analyzed. The results showed that eye movements (fixation duration and count) on product elements and endorser elements were mostly positively connected with higher recall, attitude and purchase intention and eye movements on brand elements were typically connected negatively. (*ibid.*)

Although their study (Zhang & Yuan, 2018) brought out valid relationships between attention to ad elements and ad effectiveness, the results might not be expandable to short video ad formats. Since Youtube is one of the most used video viewing platforms and it uses the TrueView advertising method, it is relevant to study relationship between ad elements and ad effectiveness in short formats separately.

In addition, a study (H. Li & Lo, 2015) that concentrated on the effect of video ad length (15 and 30 second ads) showed that longer ads are better for brand recognition. Considering that, very short ads might have significantly different results regarding ad effectiveness.

Advertising effectiveness

Advertising effectiveness is a complicated subject to assess. When companies plan their marketing activities, they get to evaluate later product sales. If it's a new product, then ad campaign impact on sales is easily measurable. In most cases though, the product is not new, or the brand is already known. In other cases sales data is not accessible (especially for researchers). Corvi & Bonera (2015) brought out in their literature review, that in academic research advertising effectiveness is mainly assessed by two models: dichotomous and three-dimensional. The dichotomous model concentrates on the product and sales, communication effect is evaluated separately. The model has its drawbacks (partial evaluation and not being able to separate effects by advertising and other marketing actions) and since researchers rarely have access to sales numbers, three-dimensional models (AIDA model, Dagmar model) are more commonly used.

The AIDA models elements are awareness, interest, desire and action (Venkatraman et al., 2015). Dagmar model consists of awareness, comprehension, conviction and action. Both of these models begin with communication from the advertiser, move on to clients cognitive affect and end with behavior. (Corvi & Bonera, 2010) For web advertising, Rossiter and Bellman (1999) proposed a new effectiveness model that includes web page content and structure of the ad, but the overall model is similar to traditional models containing awareness (exposure), interest (ad schema formation), desire (communication effects) and action.

These models being with awareness of the brand or product. This is usually measured with memory – respondents must remember the ad, brand or be able to describe parts of the communication. The affective aspect is about reaction to the provided communication. For example, attitude toward the brand, product and advertising is measured. Third element of the model is action. This means buying behavior or purchase

intention is researched. (Corvi & Bonera, 2010) These effectiveness indicators are still being widely used in different combinations (Table 1).

Table 1. Previous studies including ad effectiveness indicators

Authors	Research object	Effectiveness indicators
Guixeres et al., 2017	TV ads	Ad recall, ad liking, number of views
Hamborg, Bruns, Ollermann, & Kaspar, 2012	Banner ads	Ad recall, Ad attractiveness
K. Li, Huang, & Bente, 2016	Banner ads	Attention, Recall, Attitude toward ad
Zhang & Yuan, 2018	Video ads	Ad recall, Attitude toward ad, Attitude toward brand, Purchase intention
Siefert et al., 2008	TV ads	Ad recall, Brand recognition, Prior exposure
Lee & Ahn, 2012	Banner ads	Recognition, Attitude
T. Teixeira, Wedel, & Pieters, 2012	Video ads	Ad avoidance, Emotions, Attention dispersion
Kong, Huang, Scott, Zhang, & Shen, 2019	Images	Recall
Lane, 2003	Print ad	Repetition, Ad-evoked thoughts

(Source: composed by the author based on references in the Table)

Ad recall comes up in most of research. Ad liking, ad attractiveness and attitude toward ad all measured reaction to the communication provided by the advertiser. For banner ads, attention is measured, to see if people look at them on a webpage (K. Li et al., 2016) and for video ads, ad avoidance is assessed mostly because videos can be skipped (T. Teixeira et al., 2012). Purchase intention is not that much used, mainly because there can be a time gap between awareness and action. Some studies have included prior exposure to ads, for example when repetition effect is measured (for example Lane, 2003) or when active ads are used (Siefert et al., 2008). It has been brought out that people who have seen ads repeatedly have higher rates of recall. When TV-ads are viewed in fast-forward mode, the previous exposure is even more important to recall rates. (Siefert et al., 2008) For banner ads, viewing repetition is also important, since it increases spontaneous recall and brand awareness (Drèze & Hussherr, 2003).

Awareness (attention) and memory are mostly linked to advertising effectiveness. The hierarchy models, like AIDA and Dagmar, assume that higher attention to advertising leads to better ad memory. (Simola, Hyönä, & Kuisma, 2014) In this study ad recall and likeability are used as ad effectiveness indicators and prior exposure to ads, since active ads are used, is also assessed.

Visual attention and emotions

In order to achieve desired ad effectiveness, firstly the ads need to capture viewers' attention. Attention can be described in two ways: top-down and bottom-up. Top-down process describes the consumers intention. This means the attention is voluntary and consumers are actively searching for information. The intentions of consumers (or their interests) are not easily influenced by the marketer, so bottom-up factors are more commonly used when creating advertising. Bottom-up factors are visual marketing incentives, for example color, edges, luminance, shapes and sizes (Wedel & Pieters, 2008), that should capture the viewers' attention regarding of their intention (involuntary attention). Usually these attention types work together, firstly an ad causes involuntary attention and when consumers start to search for information, then their attention becomes voluntary.

Bottom-up factors are perceived differently by people according to their intentions (Wedel & Pieters, 2006) and biased competition theory says that elements in visual fields compete with each other to get the viewer's attention. Therefore, only a portion of ad information is cognitively processed. (Desimone & Duncan, 1995) Since intentions and cognitive processing is different for people, research should answer the question, what bottom-up factors draw in the most involuntary attention.

Ad elements that attract attention, that are more relevant and capture viewers' attention for longer are called high relevance areas. These important visual areas contain the faces of endorsers or models, the advertised product and branding information. Ad elements that attract attention can also be distinctive (big formats, center position, text elements). Visual background clutter is not good for focus (faces, products and brand elements are excluded). Other elements that attract attention are contrast, visual growth of an element, moving up or down or appearing from the middle of the screen. (B. Wooley, 2015)

Audio (narration, speaking or music) can have a guiding effect on visual attention (B. E. Wooley & March, 2014), but the effect of audio is not currently researched in this study.

Another method, in addition to visual attention in helping to understand advertising effectiveness, is emotion. Emotions and their relationship to advertising has been the topic of many studies for more than 20 years and both academics and practitioners are convinced that affect (emotion) is connected to how brand messages are processed (Micu & Plummer, 2010). In advertising, emotions research is used to identify what elements generate emotions and also which ads are more relevant from a selection (Neomániová, Berčík, & Horská, 2018).

Emotions, like eye-movements, can be unconscious and conscious. Three emotional reactions are distinguished: psychological changes from the initial reaction to stimulus; automatic mapping of stimulus and schema matching; conscious valuation of the stimulus (Pham, Cohen, Pracejus, & Hughes, 2002). This means, that something generates emotions and through type 2 (unconscious) and type 3 (conscious) processes thoughts (feelings and judgements) are generated. It has been brought out that unconscious thoughts have a greater impact on judgement and behavior (Cronley, Kardes, & Posavac, 2004). Advertisers aim to connect the brand and client through communication and change the behavior of customer, in order to drive sales. That is why the ads need to generate emotions in addition to informing about the product or brand.

Brand element effect on visual attention, recall and likeability

Stronger brands result in higher revenue streams (Esch, Langner, Schmitt, & Geus, 2006). Brand visuals are one of the key elements in advertising that introduce the company and its's products to customers. Brand elements used in advertising are usually logo or text with the brand name.

Some studies have focused on brand elements and their effectiveness. For example, in print advertisements, brand elements draw in disproportionally large amount of attention (Wedel & Pieters, 2000) and transfer attention also to other pictorial and text elements (Wedel & Pieters, 2004). For TV ads, the presence of a brand element significantly increases the probability of watching the whole TV ad. When the brand appears in the center of the screen, is well separated from the rest of the ad, and also comes up later in

the ad, the probability of longer watch time also increases. (T. S. Teixeira, Wedel, & Pieters, 2010)

On the other hand, looking numerous times at the brand element (Brand element fixation number) may negatively affect ad recall. Extended eye-movements to brand elements (Brand gaze duration) are negatively associated with attitude toward ad and, both number of times looking at the brand (fixation number) and long eye-movements (Gaze duration) are negatively linked to attitude toward the brand. The fixation amount on the brand element (Brand fixation number) is also negatively related to purchase intention. (Zhang & Yuan, 2018)

In conclusion, brand elements can draw attention and the usage of this element can help the ad to be viewed longer. However, when the eye-movements to this element are too frequent and long, then it might indicate lower ad likeability, attitude toward brand and lower purchase intention. Frequent and extended eye-movements can indicate that viewers have trouble getting information from that element or the element is new to them (meaning the brand is new) and that can also result in lower attitudes and purchase intention.

Product element effect on visual attention, recall and likeability

Advertising is one of the most important means of providing product information (Koetz, Santos, & Cliquetc, 2017). Using product images in ads can be highly effective. In typical (similar layouts used) print advertising, 90% of the cases ads and products can be recognized in under 100 milliseconds of exposure. If the ads are atypical, 70% of ads and 40% of products can be recognized. For example, typical car ads include a car in an outdoor scene, on a road with scenery. Atypical car ad for example can be indoors and without the car. (Pieters & Wedel, 2012) Advertising helps to promote products to new and existing customers and inform them about the products features.

In food marketing, adding the picture of the product in the advertisement results in the rise of ad effectiveness (Haase, Wiedmann, Bettels, & Labenz, 2018). In video advertising, long eye-movements (Gaze duration) on product elements are positively linked to ad recall, ad likeability and purchase intention (Zhang & Yuan, 2018). Longer gaze duration might show that viewers have trouble getting the needed information or

interpreting that information (Jacob & Karn, 2003), but since the results are connected with attitude and purchase intention, it might also mean, that viewers are learning about the product.

Endorser element effect on visual attention, recall and likeability

One of the high relevance elements used in video advertising is an endorser. Many advertisements use models to gain attention to its ads, unfortunately not many studies focus on endorser and ad effectiveness relationship.

Regarding banner ads, having an model in the ads can have a positive effect on the attention to the ad (Huang, 2018). Using a model, that is or seems familiar, generates more trust (Tanner & Maeng, 2012). Attractive models have a positive effect on attitude toward brand and purchase intention (Till & Busler, 2000).

Previous familiarity with endorser is positively associated with higher ad recall. Higher endorser familiarity and longer focus time on endorsers help predict ad likeability. Longer fixation duration on endorsers help predict higher attitude towards the brand. Larger fixation number on endorser is positively associated with higher purchase intention. (Zhang & Yuan, 2018) This research suggest that using a model or an endorser in ads can help increase ad attention and likeability, attitude toward brand can grow and intention to buy products might increase. Familiar endorsers are more trustworthy and help ads to be more memorable.

Emotions effect on recall and likeability

Emotions have been usually measured by two-dimensions – valence and arousal. Valence shows if the emotion is positive, negative or neutral and arousal shows the intensity. (Bakalash & Riemer, 2013) A literature review brings out that arousal has more effect on advertising recall than valence (Poels & Dewitte, 2006). This means that it does not matter if the emotion is positive or negative, the emotions intensity helps ads to be memorable.

Ad related emotions have an effect on memory and attitude (Hamelin, Moujahid, & Thaichon, 2017) and they motivate behavior (Micu & Plummer, 2010). Emotions can have an effect on the reaction to the ad (Lewinski, Fransen, & Tan, 2014) and mismatched energy levels of the ad can have a negative effect on recall (Puccinelli, Wilcox, & Grewal,

2015). The feeling of joy increases attention on the ad and feelings of joy and surprise decrease ad zapping (skipping the ad) (T. Teixeira et al., 2012). This means that strong positive emotions help ads to be viewed longer, be more likeable and memorable.

In conclusion, video advertising and ad effectiveness have been the topic of some recent studies, but effectiveness is still measured with indicators that researchers have been using for many years. Ad recall and likeability are one of the most used effectiveness indicators. For ads to be memorable and likeable, they first have to gain viewers' attention. Previous research has brought out that elements which are relevant or distinctive, capture attention better.

Method

Traditionally ads are evaluated by using self-reported measures (Venkatraman et al., 2015), but it is difficult to differentiate specific elements of the ads because people usually evaluate ads as a whole (Zhang & Yuan, 2018). Therefore, to better understand what specifically captures attention, it is best to track eye movements. This kind of attention is linked directly to cognitive processing (Fox, Krugman, Fletcher, & Fischer, 1998). Eye tracking gives insight into visual processes and it doesn't only capture the processed information but also gives a understanding of what captures attention in what order and for how long (Venkatraman et al., 2015). In recent years eye-tracking technology has advanced a lot and with modern eye-tracking methods, visual attention can easily be recorded and analyzed using large amounts of stimuli (Poole & Ball, 2006). Eye-tracking is also convenient for the participant, but at the same time gives researchers much information about what captures attention in advertising.

According to Jacob (2018) the most used measures of attention in eye-tracking research are number of fixations / number of fixation on each AOI, Gaze percentage / gaze duration mean on each AOI and fixation duration mean / fixation rate overall. The quantity of fixations and dwell times indicate how deeply information provided by the ad is processed (Venkatraman, Payne, & Huettel, 2014). Longer fixations and fewer amount of fixations show more comprehensive processing (Horstmann, Ahlgrimm, & Glöckner, 2009). Eye-fixation measurements to areas of interest (AOIs) are important in this study, because the

ads are short, and these statistics help to understand which elements are more important to the viewers.

Emotions have customarily been researched using self-report measures (verbal self-report, visual self-report and moment-to-moment rating) and autonomic measures (facial expressions, skin conductance and heart rate). Self-report measures are user-friendly and quick, but they might be cognitively biased. Autonomic measures can measure emotions in real-time and without the cognitive bias, but they might be too inconvenient for the subject. (Poels & Dewitte, 2006) Nowadays, the measurement of facial expressions are nonintrusive and it can identify emotions based on visual attention quickly (T. Teixeira et al., 2012). For example, FaceReader has been used to measure emotions in different studies (Hadinejad et al., 2019; Neomániová et al., 2018; T. Teixeira et al., 2012). In this study, emotions are also tracked with FaceReader, since it is a nonintrusive and convenient method for the participant, but on the other hand helps to understand how different ads generate different emotional responses.

The eye-tracking and face reading methods show only one side of the aspect – what captures attention and create emotion. But it doesn't answer the question if this created attention and emotion affect ad recall or likeability. Therefore eye-tracking and face reading method should be combined with traditional methods to collect multiple aspects of the viewing experience (Siefert et al., 2008).

Previous studies have mostly used a questionnaire to evaluate ad recall (Hamborg et al., 2012; Wu, Wei, & Chen, 2008; Zhang & Yuan, 2018). Ad recall has also been measured by asking about advertised brands 2 hours after the experiment (Guixeres et al., 2017). As the experiment was conducted on volunteers recruited on site, it was more comfortable for the participant to answer all the questions during the test, so ad recall was asked straight after the experiment.

Ad likeability has been usually measured by having to rate the ads on a semantic differential scale (Hamborg et al., 2012; Lee & Ahn, 2012; K. Li et al., 2016; Zhang & Yuan, 2018). Some studied have used three questions with 5-point semantic differential scale (Lewinski et al., 2014), in others likeability was assessed with five questions on a 7-point semantic differential scale: unattractive/attractive, bad/good, un-

appealing/appealing, unlikable/likable, and unpleasant/pleasant (Lee & Ahn, 2012; K. Li et al., 2016). In this study a 7-point scale is used in order to get a broader feedback of the ads.

Prior exposure to ads was also included in the survey. Prior exposure has been researched with self-reports, where participants have been asked if they have seen the ads before (Siefert et al., 2008). The effect of prior exposure can also be tested with multiple showings in a specially build test (Lane, 2003), but since this effect was not the main focus of this study, prior exposure was assessed with a question.

In previous eye-tracking studies, sample sizes vary from 35 (Guixeres et al., 2017) to 118 (Lee & Ahn, 2012), therefore this study aims to recruit at least 35 participants.

Process

In this study the sample size was 35 and respondents were between ages 17-38 years. 57% of them were female and 43% male. 10 people wore glasses. The participants were in majority all students and were recruited in a library to voluntarily participate in a study.

The research had two parts (process presented in Table 2). Firstly, the participants were shown a long video which included an introduction clip, 8 video ads and intermediate clips. Participants eye movements were tracked with eye-tracker device (Tobii X2-60) and facial expressions were captured with a video camera and later analyzed with FaceReader 7 software. The test was conducted in a library study room with artificial lighting (a room with no windows). The participants were asked to sit behind a monitor and after that a small introduction was made: “You are going to be shown a video, just relax and watch and after that, a few questions will be asked”. The participants also had to put on headphones, because the videos had audio. After watching the long video, recall was asked and participants were requested to fill out a questionnaire.

Firstly, a video was shown which imitated searching a nature video playlist in Youtube. The first ad appeared in full screen viewing mode. After each advertisement a 15-second-long nature video was played to imitate the Youtube playlist viewing experience. The ads were chosen randomly and from a wide range of products such as cars (1), energy (1), fragrances (1), clothes (1), electronics (2) and hygiene products (2). The ads varied from

3 to 8 seconds. The introduction video and nature videos were shown in the same sequence, but ads were shown in three different orders in order to lessen the ad position effect. This means that one video could have been the first ad for one participant, in the middle for second and last for third participant.

Table 2 Study's process

	Ad elements analyzed in ads	Attention and affect indicators
Part 1 – Participants viewed the video containing introduction clip, 8 ads and 8 nature videos	1. Endorser (face and body) 2. Brand (visual and textual) 3. Product (product or package)	1. Number of Fixations 2. Fixation duration 3. Average gaze duration 4. Happiness emotion
	Effectiveness indicators	Questions
Part 2 – Participants filled the questionnaire	Ad Recall (spontaneous* and aided ad recall) *Spontaneous recall was asked before the participant started to fill the questionnaire	1. Do you remember any ads? 2. If yes, which ones? Describe them please 3. List of brands/ads – which ones do you remember seeing? 4. Have you seen this ad before?
	Attitude toward ads (likeability)	Five 7-point measures: likable/unlikable, unpleasant/pleasant, appealing/unappealing, attractive/unattractive, and bad/good

Source: author

All ads had English texts or voiceover and were ads for internationally recognized brands, which products can also be bought in Estonia. All chosen ads had a different combination of product, brand and endorser elements. In every video areas of interest (AOIs) were coded according to previous studies – product, brand and endorser (Table 3).

Table 3 Detailed information of ad lengths and brand, product and endorser AOIs for each advertisement

Video	Ad length (s)	AOI length (s)		
		Product	Brand	Endorser
Mercedes	3,800	0,327	0,394	-
Burberry	5,120	-	2,333	2,974
Huawei	5,160	-	5,160	-
Garnier Fructis	6,080	3,490	1,315	1,402
Nivea	6,360	-	6,360	4,632
Duracell	6,080	6,080	6,080	-
Lindex	4,040	4,040	4,040	4,040
Sony	8,120	-	1,517	-

Source: author

Product category contained images of the product or package. Brand category AOIs included the brand name (visual or textual) and the brand logo. Endorser AOI were human faces and bodies used in the ads. No animated endorsers were among the used ads.

Since the videos had different lengths and elements also had different screen time, ad lengths and AOI lengths were taken into consideration in order to standardize eye-tracking results.

Three eye-movement measures were used in this study. Fixation count and Fixation duration were retracted from the eye-tracking study and Gaze duration was formed by dividing the two previous measures. The measurables were divided with respective ads AOI lengths in order to make the results comparable and new measures were formed.

- Fixation duration (FD) shows which AOI was longer gazed. / Transformed fixation duration (TFD) represents the ratio between fixation duration on the AOI and AOI length.
- Fixation count shows how many times AOIs were looked at. / Transformed fixation count (TFC) represents the ratio between fixation count on the AOI and AOI length.
- Average gaze duration (AGD) shows the length of eye fixation of every fixation count. The measure was formed by dividing fixation duration on AOIs by the fixation number on AOIs. It is predicted, that longer AGD shows that the participants have harder time extracting and interpreting information form the AOI element (Jacob & Karn, 2003).

Reaction (Happiness) to the ads was recorded with a web-camera and analyzed with FaceReader 7 software. FaceReader is a complete facial expression recognition software, that accurately models the participants face using 500 key points. It automatically analyzes 6 basic facial expressions: happiness, sadness, anger, surprise, fear, disgust. ("Noldus FaceReader," 2019)

After viewing the whole video, an open question was asked, if the participant remembered any ads. If yes, then they needed to name or describe the ads. After that aided ad recall was asked with the list of brands.

Ad likeability was assessed with five questions on a 7-point semantic differential scale: unattractive/attractive, bad/good, un-appealing/appealing, unlikable/likable, and unpleasant/pleasant (Lee & Ahn, 2012; K. Li et al., 2016). The participants had to evaluate all ads separately. Prior exposure to ads was asked with a question if participants have seen the videos before.

Results and analysis

Memory and attitude towards the ads were the main interests in this survey. Memory was measured with spontaneous and aided recall and attitude towards ads with self-reported likeability measures. Prior exposure was also included.

Spontaneous ad recall (Table 2) results were between 17% and 71%. Most recalled ad was Garnier and the least Huawei ad. Aided recall was between 46% and 94%. Burberry got the lowest aided recall number and Garnier and Duracell ads were recalled the highest number of times.

Table 2 Results for ad recall, likeability and previous exposure and elements marked in each video (Source: author)

Video	Elements in video	Spontaneous recall	Aided recall	Likeability	Prior exposure to the ad
Mercedes-Benz	Product	51%	86%	4,52	3%
Burberry	Face	43%	46%	4,68	3%
Huawei	Brand	17%	69%	3,36	26%
Garnier Fructis	Product, Face	71%	94%	4,21	49%
Nivea	Face, Brand	31%	66%	4,20	34%
Duracell	Product, Brand	51%	94%	4,23	17%
Lindex	Product, Face, Brand	37%	69%	4,53	23%
Sony	None*	49%	71%	5,03	6%

Note: *All the ads had brand elements, but if the brand is brought out, it means that brand element was seen in every frame of the length (100%).

Ad likeability was measured with 5 questions that were on 7-point semantic differential scale. According to the calculated average, Sony ad was assessed as the most likeable and Huawei ad was least likeable.

Prior exposure to the ads was also assessed as viewers who reported having seen the ads prior to studies have had higher ad recall rates (Siefert et al., 2008). Previous exposures in this study were between 3% and 49%. Three percent of respondents had seen Mercedes and Burberry ads before and nearly half of the respondents (49%) were familiar with the Garnier ad.

Eye-tracking survey results (Chart 1) show that Mercedes ad got the highest relative fixation duration (TFD) to brand AOI and product AOI. This might also be caused by the fact that Mercedes had the shortest AOI lengths, which means that every eye movement on brand or product has a bigger weight. The scores are also high for Burberry, Garnier and Sony (brand AOI) and Garnier and Duracell (product AOI). Mercedes ad showed the brand in the middle of the screen with high contrast. Burberry, Garnier and Sony brands were also large, in a center position and with relatively few numbers of distractors. For Huawei and Nivea ads brand was shown on top of the screen and smaller, that is probably why the fixation duration is lower. Lindex brand was in center position, but with endorsers on the background, so the visual clutter might have been bigger.

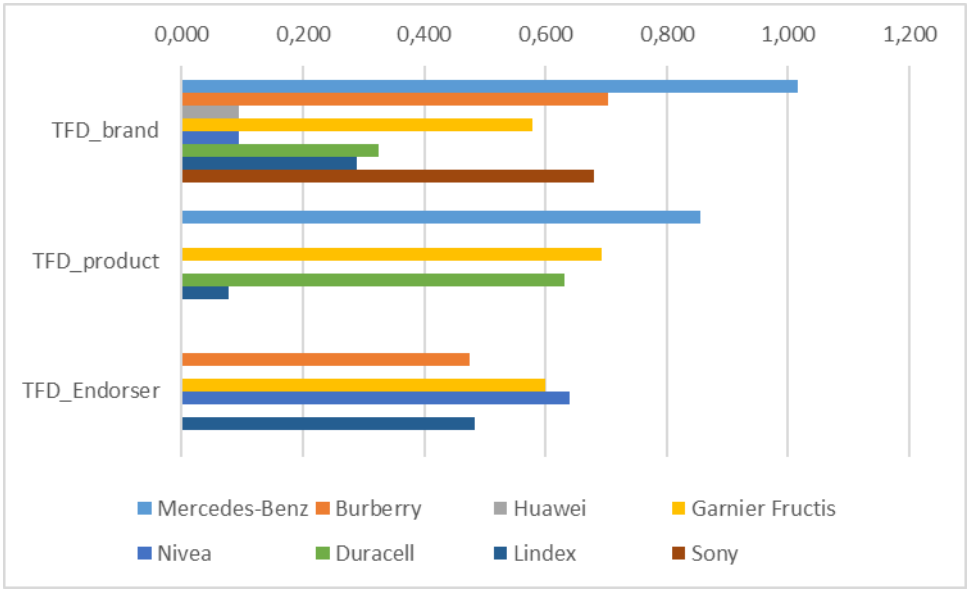

Chart 1 Transformed fixation duration (TFD) results for ads in seconds (Source: author)

The product for Mercedes and Duracell was in center position and for Garnier the ad was filled with product images. Therefore, the products were hard to miss when looking at the ad. Lindex product was clothes that the endorsers wore, and they got the smallest fixation duration result.

Endorser TFD results are relatively similar for all ads. Burberry had a male model, Garnier, Nivea and Lindex had female models. Burberry, Garnier and Nivea used a single endorser for the ad, Lindex had four people in the ad.

Fixation count on AOI (Chart 2) is related to interest and higher numbers should indicate importance of that element (Jacob & Karn, 2003). Mercedes ad had the highest relative brand TFC, the brand was shown as text. Mercedes product related TFC was also highest compared to the other ads. Burberry brand also had a higher result for TFC. The lowest results were for Huawei and Nivea brand and Lindex product. The same elements had low results for fixation duration, which might indicate that these elements were least important to participants.

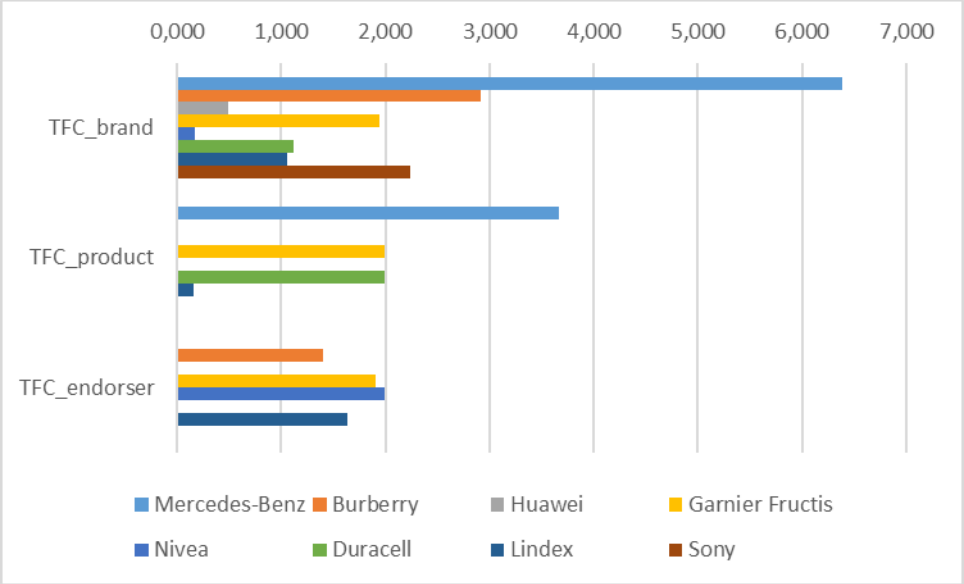

Chart 2 Transformed fixation count (TFC) results for ads (Source: author)

Average gaze duration (Chart 3) shows average fixation time per fixation on the AOIs. The highest AGD was for Nivea brand and Lindex product. Mercedes brand and product AOIs got the lowest results. Longer gaze duration might show that participants have trouble getting the needed information or interpreting that information (Jacob & Karn, 2003).

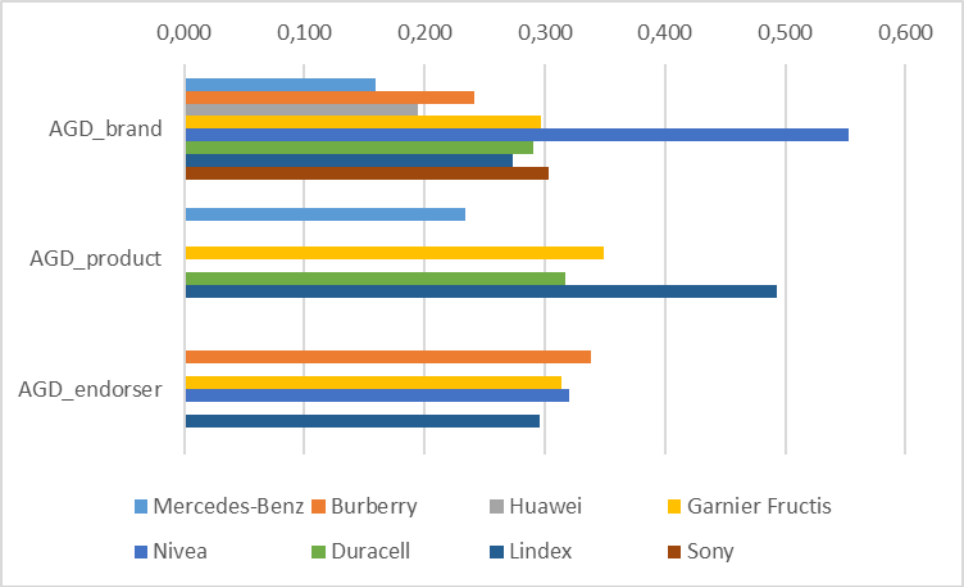

Chart 3 Average gaze duration (AGD) results for ads in seconds (Source: author)

Emotions analysis (Chart 4) shows us that the average happiness emotion. The output of emotion detection is a measure that ranges from 0 to 1 for each time frame for happiness. Higher value show that the viewer experiences measured emotion. (T. Teixeira et al., 2012) The measures show weighted average emotion of all participants. The average emotions for each participant are weighed with the average emotion of the whole study in order to level out over- and under-emotionality. The average number for emotion is 1 and results higher than 1 are over average and results lower are under average. Happiness emotion was highest for Duracell ad and lowest for Sony and Lindex ads.

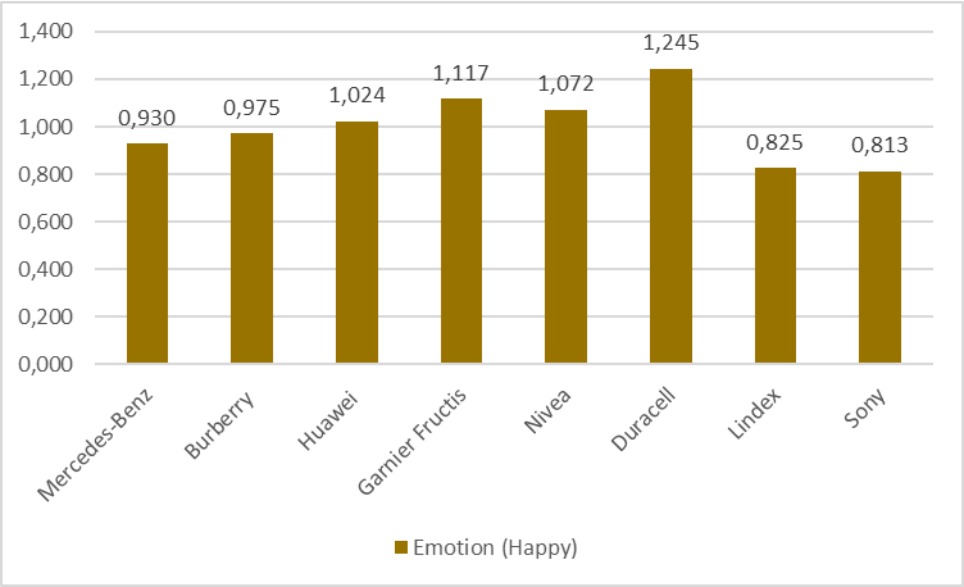

Chart 4 Average emotions of happiness from the ads (Source: author)

To test whether the eye tracking and facial emotions results have any effect on the ad effectiveness elements, a series of statistical analyses were conducted. The means of TFD, TFC and AGD were analyzed in order to understand if any of them had a statistical difference between groups of spontaneous and aided recall and likeability. Previous exposure to ads was also tested.

Shapiro-Wilk tests were conducted to assess the variables distribution. For normally distributed data, One-Way ANOVA was used, for the data that was not normally distributed, Mann-Whitney (M-W) non-parametric test and Kruskal-Wallis (K-W) tests were used. Recall was coded into 2 groups, remembered or did not remember the ad. Previous exposure was also coded into 2 groups, had seen or had not seen the ad before. Likeability had 7 groups (7-point differential scale). Main results are presented in Table 3.

Table 3 Means comparison test statistics for eye-tracking, emotions, recall, likeability and prior exposure (Source: author)

Variables	Spontaneous recall	Aided recall	Likeability	Previous contact with the ad
TFD Brand	2,741 (A)	0,684 (A)	1,399 (A)	11,967**(A)
TFD Product	1478,5 (M-W)	473,0 (M-W)	8,467 (K-W)	750** (M-W)
TFD Endorser	0,384 (A)	1,761 (A)	0,850 (A)	1,244 (A)
TFC Brand	6676,5 (M-W)	4592,5 (M-W)	12,216 (K-W)	3073,0*** (M-W)
TFC Product	1667,0 (M-W)	556,0 (M-W)	5,540 (K-W)	870,0* (M-W)
TFC Endorser	1815,0 (M-W)	1212,0 (M-W)	0,825 (K-W)	1456,5 (M-W)
AGD Brand	6531,5 (M-W)	4546,0 (M-W)	7,730 (K-W)	4231,5 (M-W)
AGD Product	1,502 (A)	8,619**(A)	0,471 (A)	0,471 (A)
AGD Endorser	1627,0 (M-W)	1317,5 (M-W)	6,281 (K-W)	1166,0 (M-W)
Happy (FaceReader)	1,363 (A)	0,038 (A)	0,973 (A)	0,359 (A)

Note 1: *p < 0,05. **p < 0,01. ***p< 0,001
Note 2: (A) - One-Way Anova, (M-W) - Mann-Whitney U Test, (K-W) - Kruskal-Wallis H Test

The means for most eye-tracking data results did not vary in a significant level compared to spontaneous and aided recall. The only significant mean differentiation was for AGD product, where participants who remembered the ad when shown brands on a list, had

substantially smaller AGD to product elements. Since lower AGD might show that the element is more easily interpreted, then these results make sense. Aided recall is higher when people connect the brand from a list and the product, that was shown in the ad (in this study a car, shampoo, battery and clothes). When the AGD for product increases, then it is more difficult to understand the meaning of the ad and therefore connect the ad with the brand.

Previous exposure to ads had the highest effect on eye movements. Brand TFC averages between groups are different on a 99,9% confidence level, brand TFD and product TFD averages between groups are different on a 99% confidence level and product TFC averages between groups are different on a 95% confidence level. This means that fixations on brand elements (TFC) are relatively lower when people have seen the ads before. These results are logical because participants are already familiar with the brand and they don't need to check the brand elements that much. Fixation duration on brand elements (TFD) is relatively higher when people have not seen the ads before. This means the participants learn new information and they fixate on the element longer. Product TFD is also relatively higher when people have not seen the ads before. The same principal applies as with brand TFD. As the ad is new, viewers want to learn who is advertising and what product is being advertised.

Product related fixation count (TFC) is relatively higher when the ads have not been seen before. Since the ad and the advertised product is new, the advertised product is more important in order to understand the purpose of the ad.

Ad likeability did not have a significant association with eye-movement results and happiness emotion. Emotions generated by the ads were not different among recall, likeability or prior exposure groups. Additional analyses were conducted to find out if previous exposure had any effect on the recall and likeability. The results showed that there was not a significant difference in the means of spontaneous and aided recall and likeability between groups who had seen the ads before and who had not.

Discussion

The study showed that when comparing brand, product and endorser TFC results (Appendix A), product related AOIs had the most fixations across all ads, brand related

AOIs came after that and endorser related AOIs had the fewest fixations. Previous studies (Zhang & Yuan, 2018) with longer video ads showed higher fixations counts on endorser elements and lower fixation counts on brand and product elements. Product related fixation durations to AOIs had the highest average duration length, then came brand and endorser AOIs held attention shortest. For longer ads (Zhang & Yuan, 2018) fixation time was also longer for endorser elements and shorter for brand and product elements. This might indicate that since ads are mainly created to advertise and inform about products, short videos demand viewers to focus firstly on what is being advertised and after that who is the advertiser.

FaceReader revealed that Duracell ad produced the most happiness emotion among participants and Sony and Lindex happiness results were the lowest. The self-reported likeability index on the other hand showed that Sony was the highest rated advertising. These results contradict previous results (Lewinski et al., 2014) where FaceReader measures correlated with participants self-reports. In this current study the correlation (Appendix B) is negative (although the correlation is not strong and statistically not significant). These results might differ because self-reported likeability has been assessed with different methods – in Lewinski et al., 2014 with three 5-point semantic differential scale items and in current study five 7-point semantic differential scale items. Another reason might be that facial expressions are involuntary, but assessing the ads means expressing emotions after cognitive processing.

In this study eye-movement measurements did not significantly differ between recall and likeability categories (except for aided recall and product related AGD). Previous studies (Zhang & Yuan, 2018) have found that eye movements on product and endorser elements are positively related with ad effectiveness and eye-movements to brand related elements are negatively related. In this study these correlations did not occur.

This study's main results were related with previous ad exposure. People who marked previous exposure to the ads in their self-reports, had significantly different results in brand related fixation count, fixation duration, product related fixation count and fixation duration. These results match with Siefert (2008), who found that eye-movements during fast-forwarding were affected by previous contact with the ad. Lower rates of visual processing activity might have been affected by previous memory and participants might

have “filled” missing information with traces of memory (*ibid.*). On the other hand, there have been studies (Guixeres et al., 2017) where number of fixations on the brand element is positively related with number of views on the Internet (Youtube video views).

Since there were little significant relationships between eye-tracking measurements and feeling of happiness, memory and likeability, the main practical suggestions come from visual analysis. This study showed that videos, where the product element was in center position (Duracell) or the scene was filled with product images (Garnier) fixation duration was longer. When brand element was in the center position and without visual clutter (Mercedes, Burberry, Garnier, Sony), the element got longer views. When brand element was small or in the scene with other visuals, the views were shorter. It has been brought out that highly salient features (large size, center position and text) are more likely to draw in visual attention (B. Wooley, 2015). Endorser elements in different ads had similar eye-tracking measures and in this study endorser related results got average results, meaning different usage of models did not caught more attention than brand or product elements.

Highly salient features are even more important for short videos, because the timeframe to gain viewers’ attention is even shorter. For short videos, product elements were more frequently (higher fixation count) and longer looked at (longer view durations) than brand and endorser elements. This might mean that viewers want to know what is being advertised quickly and without having to look for information or concentrate on other elements.

The results in this study might also differ from previous studies because there are variances in method, subjects, objects or video length. Video length as the influencer of eye-tracking measurements could also be researched in a separate study, where long (15-30 second) and short (3-8 second) videos are tested by the same subjects.

There could also be other influencers that predict more accurately the effectiveness of the ads. Since previous exposure to ads was relevant in this study, previous relationship with brands or products might also predict memory or ad likeability.

Another subject, not covered in this research, is screen size. Since the usage of mobile phone is growing, there might be differences in eye-tracking measurements between screen sizes. Screen size and its effect on online searches has been researched (Findlater & McGrenere, 2008; Jones, Buchanan, & Thimbleby, 2003) and there has also been an eye-tracking study on this subject (Kim, Thomas, Sankaranarayana, Gedeon, & Yoon, 2015), but to the authors knowledge there have not been studies on video ads.

The process of the study was created to be as natural for the participant as possible, but as technology advances, hopefully this kind of research can be made even more ordinary (different screen size possibilities, different lightning possibilities). This might help involve more people, which means more accurate results from more natural settings.

Conclusion

The purpose of this study was to determine how ad elements in short Youtube ads are related to recall and likeability of these ads. In order to achieve this, eight 3-8 second ads were shown to 35 participants and their eye-movement and facial emotions were tracked. In the analysis, areas of interest were coded for each ad in order to assess specific ad elements (brand, product and endorser elements). Ad recall and likeability was measured by asking the participants to complete a questionnaire.

The study's theoretical background is based on advertising hierarchy models (AIDA, Dagmar) where advertising firstly needs to capture attention for customers to be aware of the product or brand. Awareness is usually measured with recall. The communication creates should create interest and desire and it is measured with attitude toward the ad, brand or product. Lastly, advertisement need to lead customers to buy the product. This is measured with purchase intention or actual purchase, but this measurement is not that widely used, because usually there is a delay between seeing the ad an buying the product. These measurements all show how effective ads are. Recall and likeability indicators are most widely used in academic research. The second part of theory concentrates on how visual attention and emotions generated by ads are connected to these effectiveness indicators.

Previous research has determined that there are relationships between eye-movements to ad elements and recall and likeability, but no significant associations came out in this

current study. The most notable effect on eye-measurements was prior exposure to ads. Prior exposure affected eye-fixation duration and eye-fixation count to brand and product elements.

It has also been found that measurable emotions predict ad likeability. In this study, this effect did not occur, and the relationship was even slightly the opposite, meaning higher self-assessed ads received the lowest happiness emotion scores. The results might be affected by how the likeability is determined with questions or that self-reports acquire more cognitive processing.

To the authors knowledge, short ads have not been the subject of research in the context of ad effectiveness. In order to assess the effect of video length more efficiently, different lengths of videos should be included in the same study. Also, in order to lessen the prior exposure effect, researchers might consider using novel ads to analyze recall and likeability. Other relationships between brand, product, endorser and participants might affect recall and likeability and can be pretested in future studies. Audio and its guiding effect can also be the topic of future studies that concentrate on ad elements and effectiveness.

Since this study did not find the relationships between ad elements, recall and likeability that other studies have determined, the main findings are from the visual analysis. Brand and product elements should be visualized in center position and without background clutter. If the brand element is the corner of the ad, the noticeabilty is much lower. Endorsers got the lowest number of fixations and they were not as much looked at as brand and product elements, so when ad creators need to choose, then out of these three elements, endorsers were least important to viewers.

In conclusion, video advertising is shown more and more in different internet sites where it has to compete with other content in order to attract viewers' attention. Also, the viewers' attention span is shorter which means the ads need to be shorter too. However, if made creatively, the ads can still create emotion, be likeable and memorable.

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APPENDICES

Appendix A - Descriptive statistics for each eye movements indicator

Element	Mean	Std. Deviation
TFD Brand	0,500	0,356
TFD Product	0,559	0,306
TFD Endorser	0,454	0,207
TFC Brand	2,230	2,038
TFC Product	2,299	1,342
TFC Endorser	1,810	0,697
AGD Brand	0,254	0,122
AGD Product	0,274	0,274
AGD Endorser	0,242	0,111
FaceReader - Joy	0,980	0,636

Appendix B - Correlations between eye-movement measurements, happiness, recall, likeability and previous exposure (Spearman's rho)

Correlations														
	TFD brand	TFD product	TFD Endorser	TFC brand	TFC product	TFC endorser	AGD brand	AGD product	AGD endorser	FR	Spontaneous recall	Aided recall	Likeability	Previous exposure
TFD brand	1,000	,466**	0,144	,862**	,631**	-0,108	,182**	0,089	0,133	-0,033	0,095	0,060	,222**	-,230**
TFD product	,466**	1,000	,594**	,522**	,647**	-0,066	-0,109	,684**	0,283	0,038	-0,105	-0,096	0,049	-,295**
TFD Endorser	0,144	,594**	1,000	0,055	,454**	,486**	0,075	,420**	,589**	-0,068	,186*	0,117	0,056	0,151
TFC brand	,862**	,522**	0,055	1,000	,733**	-0,022	-,198**	0,058	-0,006	-0,032	0,123	0,103	,174**	-,275**
TFC product	,631**	,647**	,454**	,733**	1,000	0,126	-,275**	-0,002	0,204	-0,020	0,025	0,028	0,000	-,230*
TFC endorser	-0,108	-0,066	,486**	-0,022	0,126	1,000	-0,139	-0,215	-0,171	0,007	0,071	0,101	0,025	-0,079
AGD brand	,182**	-0,109	0,075	-,198**	-,275**	-0,139	1,000	0,151	,193*	0,007	-0,113	-0,098	,136*	0,085
AGD product	0,089	,684**	,420**	0,058	-0,002	-0,215	0,151	1,000	0,268	0,133	-0,139	-0,111	0,091	-0,101
AGD endorser	0,133	0,283	,589**	-0,006	0,204	-0,171	,193*	0,268	1,000	-,184*	0,103	-0,017	-0,050	0,146
Happy (FaceReader)	-0,033	0,038	-0,068	-0,032	-0,020	0,007	0,007	0,133	-,184*	1,000	-0,070	-0,017	-0,063	0,004

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

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